

REMARKS/ARGUMENTS

Claims 1-27 and 44-48 remain in the application for further prosecution. Claim 44 has been amended. Please cancel claims 28-43 and 45.

Claim Amendments

Claim 44 has been amended to place it in better form for consideration on appeal. Claim 44 has been amended to include the limitations of dependent claim 45, and does not add any new matter. Entry of the amendment is respectfully requested.

Claim Rejections – 35 U.S.C. § 103

The Office Action maintains the rejection of Claims 1-27 and 44-48 under 35 U.S.C. § 103(a) as being allegedly unpatentable over Mead (U.S. Patent No. 6,044,162) et al. in view of Groppe (U.S. Patent No. 5,086,464). Applicants respectfully traverse these rejections and submit that the claims are patentable over Mead and Groppe for at least the following reasons.

Section 2141 of the MPEP states that when applying a Section 103 rejection, the following tenets of patent law must be adhered to:

- A. The claimed invention must be considered as a whole;
- B. The references must be considered as a whole and must suggest the desirability and thus the obviousness of making the combination;
- C. The references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention; and
- D. Reasonable expectation of success is the standard with which obviousness is determined.

Applicants respectfully submit that these tenets have not been followed in the following respects. First, with respect to independent claims 17, 44, and 48 and associated dependent claims, including claims 18, 24, and 25, Mead and Groppe even considered as a whole fail to disclose a telecoil that outputs both audio and **non-audio** frequency signals. Non-audio frequency signals are distinct from audio frequency signals, which have a range of, for example, approximately 20 Hz to 10 kHz. Page 7, line 3 of the specification discloses an example of non-audio frequency signals as falling within the range of 30 kHz to 300 kHz, outside the audio

frequency range, and can be used, for example, for programming or controlling the hearing aid.
Page 7, lines 3-10.

The Office Action points to nothing in Mead or Groppe that disclose a telecoil that outputs a non-audio frequency signal and is therefore applying impermissible hindsight vision to reject the claims. Second, a *prima facie* case of obviousness has not been established with respect to the other claims because there is no suggestion or motivation in Mead and Groppe themselves or in the knowledge generally available to one of ordinary skill in the art to modify Mead or Groppe or to combine the teachings of Mead and Groppe in the manner claimed.

All The Elements Recited In Claims 17, 44, And 48 Have Not Been Disclosed
In The Cited Prior Art

Applicants again respectfully traverse the rejections of claims 17, 44, and 48 and their associated dependent claims. As pointed out in the Reply to the June 4, 2003, Office Action, Mead explicitly provides that “an input transducer 12 converts acoustical energy into an analog electrical signal.” Mead, col. 5, ll. 43-44 (emphasis added). Acoustical energy exists in the **audio** frequency range, not in the non-audio frequency range. Groppe discloses that the telephone headset 20 is placed against a telephone receiver T for magnetic induction pickup in a conventional manner. Such arrangement permits an “amplified telephone conversation” (*i.e.*, a conversation in the audio frequency range) to be transmitted into the wearer’s ear. Col. 2, ll. 42-55. Thus, both Mead and Groppe disclose processing **audio** frequency signals only, and nowhere disclose processing non-audio frequency signals (claims 17 and 48) or control band frequency signals (claim 44).

By contrast, Claim 17 recites:

17. A telecoil system for a hearing aid, comprising:
- a telecoil for producing electrical output signals in response to being exposed to an electromagnetic field, said electrical output signals including an audio frequency signal and a **non-audio frequency signal**; and
 - an integrated circuit having an amplifier for amplifying said electrical output signal, a first filter for passing said audio frequency signal, and a **second filter for passing said non-audio frequency signal**.

Claim 48 recites:

48. A telecoil system for a listening device, comprising:
- a telecoil for producing electrical output signals in response to being exposed to an electromagnetic field, said electrical output signals including an audio frequency signal and a **non-audio frequency signal**; and
 - a hybrid circuit including at least one integrated circuit placed on a common miniature device that fits within a hearing aid, said hybrid circuit having an amplifier for amplifying said electrical output signal and at least one filter for passing said audio frequency signal.

The two groups of bandpass filters shown in FIG. 8 of Mead process signals with frequencies above and below the resonance of the iron-armature transducer 12, or 1 kHz in the example provided. Col. 18, ll. 15-25, 37-53. Moreover, according to Mead, the signals passed to the bandpass signals are representative of **acoustical** energy: "In hearing compensation system 110, an electret microphone transduces **acoustical energy** into an electrical signal, $s(t)$, that is fed through preamplifier 130 to differential A/D converter 132." Col. 18, ll. 42-44. With respect to Groppe, no filter is disclosed or suggested in Groppe, let alone a filter that passes a non-audio frequency signal. Thus, neither Mead nor Groppe teaches or discloses a telecoil producing, *inter alia*, a non-audio frequency signal as called for by claims 17 and 48 or a second filter for passing such non-audio frequency signal as called for by claim 48.

Claim 44 as presently amended recites:

44. A method of operating a listening device, comprising:
- converting electromagnetic radiation to an analog electrical signal with a telecoil;
 - receiving said analog electrical signal in an integrated circuit;
 - amplifying, in said integrated circuit, said analog electrical signal to develop an amplified analog signal;
 - converting, in said integrated circuit, said amplified analog signal to a digital signal;
 - processing, in said integrated circuit, said digital signal into at least two digital outputs, one of said at least two digital outputs being an audio frequency band output, another of said at least two digital outputs being a **control band frequency output**; and

operating said listening device in a manner corresponding to said control band frequency output.

Nothing in Mead or Groppe teaches or suggests operating a listening device in a manner corresponding to a control band frequency output, which is distinct from an audio frequency band output. *See, e.g.*, Applicants' Specification, page 6, line 34 to page 7, line 3. Because the Mead and Groppe devices function entirely within the acoustical frequency range, a skilled artisan, after reading Mead and Groppe, would not be motivated to modify the references to function outside of the acoustical frequency range. To do so would completely alter the principle of operation of the Mead and Groppe devices and would require a substantial redesign. As such, the teachings of Mead and Groppe are insufficient to render the claims obvious. *In re Ratti*, 270 F.2d 810, 813 (CCPA 1959).

Thus, the only source that teaches the handling of non-audio frequency signals in a telecoil system or operating a listening device in a manner corresponding to a control band frequency output is the Applicants' own disclosure, and reliance on such disclosure to reject claims 17, 44, and 48 would be improperly based on impermissible hindsight reconstruction.

A Prima Facie Case Of Obviousness Has Not Been Made With Respect To Each Of The Independent Claims Because There Is No Evidence To Suggest The Desirability Of The Claimed Combinations

Independent of the reasons set forth above with respect to claims 17, 44, and 48, these claims and claims 1, 8, and 15 are patentable over Mead in view of Groppe for at least the reason that there is no evidence to suggest the desirability of the combinations and methods as claimed. The Office Action acknowledges that Mead does not teach a telecoil or an integrated or hybrid circuit as claimed. Groppe does not disclose a filter or an integrated or hybrid circuit as claimed. Thus, the combination of Mead and Groppe fails to teach or disclose the combination of a telecoil with an integrated or hybrid circuit as claimed.

The stated basis for rejecting the claims is that "providing IC technology for a hearing device is very well known in the art, it would therefore have been obvious to one skilled in the art at the time the invention was made to be motivated to provide a IC including all necessary elements for the hearing device, in order to provide a more integrated and size reduced hearing

device, also with less power consumption.” Office Action, at 3. Thus, the Office Action points to nothing in Mead or Groppe to support this assertion, but rather appears to base it upon common knowledge or well-known prior art. In the prior Reply, Applicants properly challenged these assertions by noting that there was no evidence in the record that it was very well known to provide an integrated or hybrid circuit **with a telecoil as claimed**. To the extent that the rejection is based on common knowledge or well-known prior art, the Examiner must produce authority or substantial evidence to support such rejection. MPEP 2144.03.

Applicants submit that it would not have been obvious to a skilled artisan to provide a system having a telecoil and an amplifier and filter integrated onto an integrated circuit. That telecoils or integrated circuits individually may be very well known in the art is not sufficient to hold that a **telecoil as claimed** in combination with an amplifier and filter integrated onto an IC is very well known. There must be some suggestion or motivation to combine these components in the manner claimed. MPEP 2143.01. The mere fact that these components can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680 (Fed. Cir. 1990). Because nothing (except Applicants’ own teaching) has been shown to suggest the desirability of combining a telecoil with an amplifier and filter integrated onto an IC as claimed, a *prima facie* case of obviousness has not been established. For at least these reasons, amended claims 1, 8, and 15, and their respective dependent claims, are believed to be patentable over Mead in view of Groppe.

In the Response to Amendment section of the Office Action, the Examiner notes that the test for combining references is what the references as a whole would have suggested a skilled artisan. Office Action, at 6. However, here, the Office Action expressly acknowledges that the references do not disclose an integrated circuit as claimed. Thus, there is nothing in Mead or Groppe that would have suggested to a skilled artisan to integrate an amplifier and filter onto an integrated circuit in a telecoil system. Because nothing except Applicants’ disclosure suggests the desirability of such a combination, claims 1, 8, and 15 are not obvious.

The dependent claims are allowable for at least the reason that there is no teaching or suggestion of a motivation to combine elements as claimed in the dependent claims

The following dependent claims are believed to be allowable for at least the reason that the independent claim from which they depend is allowable. In addition, they are believed to be allowable for at least the following additional reason(s):

Regarding claims 2-6, these claims call for one or more additional amplifiers, filters, and signal processors to be integrated onto the IC of claim 1. For the same reasons that it would not have been obvious to a skilled artisan to combine a telecoil with an IC having an amplifier and filter, it would not have been obvious to integrate the additional components called for in claims 2-6 onto the same IC.

The Office Action rejected claims 7, 14, 16, and 27 on the basis that “providing a center-tapped telecoil **as claimed** for a hearing device is very well known in the art, it therefore would have been obvious to one skilled in the art at the time the invention was made to be motivated to provide the center-tapped telecoil with two signal output terminals for the hearing device, in order to provide users a wireless communication hearing device with desirable acoustic characteristics.” Office Action, at 4. Neither Mead nor Groppe discloses a center-tapped telecoil. To the extent that the rejection is based on common knowledge or well-known prior art, the Examiner must produce authority or substantial evidence to support the rationale that providing a center-tapped telecoil with an integrated circuit as claimed would have been obvious to a skilled artisan. Just because center-tapped telecoils individually may be well known in the art, there has been shown no suggestion for the desirability of combining a center-tapped telecoil with an amplifier and filter integrated onto an IC as claimed. Without such a suggestion, the claims are not obvious. Thus, claims 7, 14, 16, and 27 are believed to be patentable over Mead in view of Groppe.

Regarding claim 26, Groppe does not teach or suggest including a capacitor in parallel with a telecoil for increasing the sensitivity of the telecoil to a non-audio frequency signal. Both Mead and Groppe operate in the audio frequency range, and teach or suggest nothing about operation in a non-audio frequency range.

Regarding claim 18, Mead does not disclose an integrated circuit having a first filter, a second filter, and a third filter for passing a non-audio frequency signal. Mead explicitly teaches

that the input transducer 12 converts acoustical energy into an analog electrical signal. Thus, the bandpass filter 116-3 shown in Mead is passing an audio frequency signal, not a non-audio frequency signal, such as signals used for programming or controlling a hearing aid, as claimed in claim 18. In addition, it would not have been obvious to a skilled artisan to integrate a third filter onto an integrated circuit having a first filter, a second filter, and a first amplifier as claimed.

Regarding claims 19-20, neither Mead nor Groppe discloses differentially or single-ended coupling a telecoil and an amplifier in a telecoil system. The stated reason for rejecting this claim in the Office Action is that Mead allegedly discloses a third filter (116-3) for receiving the first amplified signal and for generating a third filtered signal as claimed. Office Action, at 4. Because the Office Action makes no mention of the claimed differential or single-ended coupling, the stated reason for the rejections is not proper. Moreover, it would not have been obvious to a skilled artisan to couple the claimed telecoil with an amplifier via a differential or single-ended coupling.

Claim 24 is allowable for at least the additional reason that Mead does not disclose an analog-to-digital converter for providing a digital output of a non-audio frequency signal. Nowhere does Mead teach or suggest a non-audio frequency signal, but rather explicitly discloses that the input signal is in the form of acoustical energy.

Claim 25 is allowable for at least the additional reason that Mead does not disclose a microcontroller for processing a non-audio frequency signal, the microcontroller providing functions for the operation of a hearing aid in response to the non-audio frequency signal. Nowhere does Mead teach or suggest a non-audio frequency signal, but rather explicitly discloses that the input signal is in the form of acoustical energy.

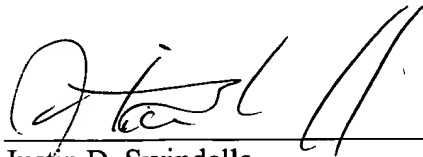
Conclusion

It is the Applicants' belief that all of the claims are now in condition for allowance and action towards that effect is respectfully requested.

If there are any matters which may be resolved or clarified through a telephone interview, the Examiner is requested to contact the undersigned attorney at the number indicated.

No fees are believed to be due with this paper, however, the Commissioner is authorized to charge any additional fees which may be required (except the issue fee) to JENKENS & GILCHRIST, P.C., Deposit Account No. 10-0447 (47161-00016USPT).

Respectfully submitted,



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